Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of:	)	
	)	
Amendment of the Commission's Rules to	)	
Facilitating the Use of Cellular Telephones and Other	)	WT Docket 04-435
Wireless Devices Aboard Airborne Aircraft	)	

COMMENTS OF AIRCELL, INC.

AirCell, Inc. ("AirCell") hereby submits these comments in the above-referenced docket in response to the Commission's tentative conclusion, contained in its recent Notice of Proposed Rulemaking ("NPRM"),[1] to relax the ban on the use of cellular handsets on commercial aircraft. As the largest provider of air-to-ground telephone communications systems to general aviation in the world, AirCell believes that wireless communications can safely and profitably be made available to commercial airline passengers. Specifically, AirCell believes that cellular and other wireless frequencies can be used within the airline cabin by employing pico cells or similar solutions to provide wireless communications to airline passengers' own devices while in flight, without any interference to terrestrial networks.

Accordingly, AirCell urges the Commission to adopt rules, with appropriate protections for terrestrial licensees, that will allow the use, via pico cell architecture, of cellular and other CMRS frequencies on aircraft to bring modern wireless communications to airline passengers. AirCell's comments below respond to the specific questions and concerns raised in Part II.A of the NPRM. AirCell takes no position at this time on the questions raised in Part II.B, regarding expanding –

[1] *See Amendment of the Commission's Rules to Facilitate the Use of Cellular Telephones and other Wireless Devices Aboard Airborne Aircraft*, WT Docket No. 04-435, Notice of Proposed Rulemaking, FCC 04-288 (rel. Feb. 15, 2005) ("NPRM").

beyond the method already available using AirCell's proprietary technology pursuant to the AirCell Waiver[2] – the use of cellular frequencies to provide air-to-ground links.

I. Background

In 1991, the Commission prohibited the use of 800 MHz cellular handsets in airborne aircraft. This ban was codified out of concern that standard consumer cellular handsets would cause interference to terrestrial cellular networks if used while airborne. As the Commission pointed out at the time, the use of a cellular handset during flight could result in communications to multiple cell sites at the same time over a wide geographic area, negating the fundamental underpinning of cellular technology – that frequencies can be reused in multiple sites throughout the country without harmful interference. The ban on airborne use of cellular handsets thus has served as a useful protection for terrestrial cellular service and has been a fixture of commercial air travel.

In 1998 the FCC waived the ban on airborne use of cellular handsets for the unique nationwide airborne cellular service developed by AirCell. AirCell employs proprietary technology to enable the use of cellular frequencies between airborne transceivers and cellular ground stations in a way that does not interfere with terrestrial network operations. This waiver has allowed AirCell to build extensive operational and technological expertise related to the provision of air-to-ground services, making it uniquely qualified to comment in this proceeding. As part of its work in this area, AirCell is also developing new applications of pico cell technology for aircraft that will enable airline passengers to use their own wireless handsets, laptops and PDAs while flying. AirCell will be conducting controlled flight demonstrations of its technology in July of this year.

---

[2] *See AirCell, Inc.; Petition, Pursuant to Section 7 of the Act, for a Waiver of the Airborne Cellular Rule, Or, in the Alternative, For a Declaratory Ruling*, Memorandum Opinion and Order, 15 FC Rcd 9622 (2000) ("AirCell Waiver").

II. The Commission Should Remove the Ban On Airborne Cellular Handset Use While Ensuring that Ground Networks of All CMRS Providers are Protected

AirCell supports the removal of the ban on the use of cellular handsets on commercial aircraft in order to allow for the introduction of modern wireless communications on U.S. airlines. The airline industry and its passengers represent a sizable market that until now has been unable to fully benefit from the capabilities of the wireless electronic devices that have revolutionized business and personal communications on the ground. While handsets, PDAs, and wireless-enabled laptop computers are a staple of modern communications, they are unusable once an airliner pulls away from an airport gate, sometimes for up to 6 hours at a time. Allowing the use of handsets and other wireless devices during flight would boost the productivity of business travelers and enhance personal communications for many millions of airline passengers.

AirCell, however, recognizes the overriding importance of ensuring that airborne communications do not interfere with wireless communications services on the ground, which are provided by the holders of exclusive spectrum licenses for terrestrial (land mobile) communications and must be protected. As the NPRM correctly noted, this could be accomplished through the use of in-cabin pico cells or similar RF management devices, which will ensure that emissions from airborne devices are limited to a sufficiently low level so that they cannot interfere with terrestrial systems.[3] However, while amending Section 22.925, as the NPRM proposes, to mandate the use of RF management devices to protect cellular networks, the terrestrial networks of PCS, SMR and Part 27 wireless providers would remain vulnerable to interference. Assuming the FAA ban on wireless handset use is eventually lifted,[4] there will be no practical means to discern

[3] *See* NPRM at ¶¶ 13-14. AirCell does not support any rule that would require modifications to the passenger device itself. Such decisions should be left to the wireless industry as marketplace developments warrant.

[4] AirCell expects, however, that the FAA's policy of prohibiting the use of any electronic device during takeoffs and landings will be continued, for aircraft and passenger safety purposes. With

between handsets using cellular frequencies and those operating in other bands. Thus, AirCell believes similar protections should be extended to the wireless services operating pursuant to Parts 24, 27 and 90.

A pico-cell architecture requirement would enhance the protection of all terrestrial wireless networks even beyond what is provided by the current use prohibition. At present, there is no effective means of policing in-flight handset use (from lavatories, for instance) or accidental transmissions from handsets not turned off after the aircraft has left the gate. An active RF management solution can address this problem by locking onto any in-cabin cellular handset signals and controlling them to prevent interference with terrestrial wireless calls. To ensure effective protection of terrestrial networks, however, any airborne solution must include the use of "masking signals" to prevent handsets from registering on terrestrial base stations.[5] A handset will try, whenever possible, to register upon its "home" system or on a system identified within its preferred roamer list. Thus, even if there is an appropriate pico cell signal on the aircraft, a handset may nonetheless attempt to register on a terrestrial cell with a higher preference than that of the pico cell. To prevent such an occurrence, the Commission's rules should require any airborne communications system to transmit a "masking" signal throughout the cabin, which will effectively make any terrestrial base station signals that may reach the aircraft unsuitable for registration attempts. Handsets will then register on the appropriate onboard pico cell. If there is not a functioning onboard pico cell, or if the handset is programmed not to permit registration on the available pico cell, the handset will enter a search or quiescent state, and will in no case communicate with a terrestrial base station. The masking signal must be required to cover all

---

this prohibition in effect, passenger devices would not be enabled until the aircraft is above 10,000 feet, providing an additional measure of protection for ground networks.

[5] This responds to the NPRM's query regarding "how interference protection would be provided to terrestrial operations." NPRM at ¶ 17.

channels on which a registration attempt is feasible for any onboard handset. The use of a masking system would address the Commission's concern that the failure of a pico cell could result in interference to terrestrial networks.[6] If the pico cell fails, the masking signal will prevent any handset from registering and communicating with a terrestrial network.[7]

III. No Provider Restriction or License Requirement Should Be Imposed for Airborne Pico Cells

The NPRM's proposal that only cellular licensees should be authorized to operate pico cell systems using cellular frequencies is both inappropriate and unworkable.[8] Recognizing the transitory nature of airborne pico cells, the NPRM makes the unprecedented suggestion that "any 800 MHz cellular licensee, regardless of the location of their service area and flight path of the aircraft, would be authorized to install a pico cell that operates on these frequencies within the aircraft."[9] This suggestion itself recognizes the impossibility of applying traditional geographic licensing concepts to airborne operations. Having done so, however, it then fails to explain why a licensee of a cellular system in, for example, New York should have a greater right than any other (non-cellular licensee) party would have to provide service using spectrum above a cellular license area in, for example, Texas. The proposal becomes even more unsupportable considering that pico cells are likely to operate not only on cellular frequencies, but on other CMRS frequencies as well. In this case, would each pico cell need to be affiliated with at least one licensee from each service band (PCS, SMR, etc.) on which it operates? Moreover, would there need to be both a cellular A

---

[6] See NPRM at ¶ 16 ("if an airborne pico cell were to fail, how should our regulations address the risk of airborne cellular handsets beginning to search for a terrestrial base station and transmitting at maximum power?").

[7] Should the masking system also fail, the equipment could provide a failure warning mechanism so that the cabin crew can instruct passengers that all wireless devices must be turned off for the remainder of the flight.

[8] NPRM at ¶ 17.

[9] *Id.*

block and cellular B block licensee (and likewise for the other services) affiliated with the pico cell in order to cover all the frequencies?[10]

Rather than limiting the provisioning of pico cell service to incumbent terrestrial licensees, the Commission should adopt a flexible and competitive approach that will also permit the airlines, the holder(s) of the 800 MHz air-to-ground ("ATG") license(s), satellite operators, or other third parties to develop innovative business models using airborne pico cells. There is nothing inherent in the use of wireless devices on aircraft that requires that only terrestrial licensees be able to provide service. Indeed, parties with aviation experience are also well suited to provide in-flight services. Aviation-focused companies operate in an environment that is far more demanding than the terrestrial cellular environment: margins for error are minimal and the consequences of mistakes can be extremely serious.[11]

Given the innovative nature of the service being proposed, there may be no perfectly analogous service with an existing regulatory regime that could be replicated to govern in-plane communications.[12] However, of the various existing regimes, the unlicensed context may provide

---

[10] Many of the wireless devices used on board will be data devices that are not associated with ground cellular licensees. For example, high demand is expected from passengers with Wi-Fi-enabled laptop computers. At a minimum, therefore, there can be no argument that pico cells, access points or other similar devices limited to bands designated for unlicensed use should be operated only by the holder of a specific spectrum license.

[11] Any system installed and operated onboard a commercial aircraft must meet rigorous FAA certification requirements. All hardware is aggressively tested for safety compliance and all manufacturing facilities and procedures must meet strict FAA requirements. For example, AirCell, itself a non-licensee, has extensive experience working with the FAA and has multiple Supplemental Type Certificates from the FAA for installation of hardware on numerous types of jet aircraft, including commercial aircraft.

[12] For example, the NPRM suggested that "a pico cell is analogous to an in-building wireless system . . . for use in the aircraft," NPRM at ¶ 13, but in fact the analogy goes only so far. In-building repeaters take signals from outside a building and retransmit them inside the building in order to connect indoor handsets with the terrestrial networks. The purpose of a pico cell or related airborne RF management system is the reverse – *i.e.*, to ensure that handsets in the plane do *not* contact the terrestrial networks. Thus, the Commission's current policy of requiring in-building radiators to be under the control of a licensee when operating above unlicensed device power

the best analogy, given that any pico cell solution would be required to reduce airborne emissions to very low levels that would preclude any harmful interference to terrestrial networks.[13] Of course, the Commission may need to adopt additional, specialized rules – as it has done in other contexts – to accommodate in-plane communications while ensuring adequate protection to terrestrial networks.[14] Although Part 15 operations appear to provide the best analogy to the proposed service, AirCell recognizes that the Commission will also be considering other regulatory approaches.[15] AirCell again urges the Commission to adopt a flexible approach that will not restrict competition by needlessly limiting the pool of potential service providers.

It is important to recognize that flexibility can be accomplished without sacrificing protection to terrestrial operators. For example, AirCell appreciates the Commission's concern that its rules "should provide for clear identification of the particular entity or entities responsible for airborne pico cell operations."[16] AirCell notes that licensing is not needed to satisfy such a concern, which could be effectively addressed by a simple registration requirement, as the

---

thresholds would not be necessary or appropriate in this context. *See Amendment of Part 22 of the Commission's Rules To Benefit the Consumers of Air-Ground Telecommunications Services,* WT Docket No. 03-103, Report and Order, FCC 04-287 (rel. Feb. 22, 2005) at ¶ 133 (clarifying current policy regarding in-building radiators).

[13] *See* 47 C.F.R. § 15.5 *et seq.* (unlicensed devices may operate in licensed spectrum bands on a non-interfering basis with the licensed service; there are no restrictions on who can provide wireless services).

[14] *See, e.g.,* 47 C.F.R. § 15.240 (permitting higher power levels for radio frequency identification ("RFID") devices operating in the 433 MHz band in certain types of locations where there would be little or no risk of harmful interference to the licensed services operating in that band).

[15] *See* NPRM at ¶ 19 (seeking comment on the possible individual licensing of pico cells). A second best alternative to unlicensed operation would be to provide for the operation of pico cells on a "licensed by rule" basis as has been done for a number of Part 95 services, including the Wireless Medical Telemetry Service and the Family Radio Service. *See* 47 C.F.R. §§95.1105, 95.191. Under these rules, a party need not obtain an individual licensee, but is simply deemed to be Commission licensee by virtue of operating the wireless device.

[16] NPRM at ¶ 19.

Commission has employed in other contexts.[17] For example, pico cell operators could be required to register each pico cell installation with the Commission, [18] indicating the specific aircraft call sign, airline, and service provider contact information. The Commission database could be used in conjunction with flight records to identify the source of any reports of harmful interference by terrestrial licensees.[19]

Finally, no license would be needed to ensure compliance with any emission limit or other technical standards that may be established. The Commission's equipment certification process is effective for this purpose, as it is for other unlicensed devices. Moreover, unlike the environment in which most other communications equipment is certified by the FCC only, the FAA's concern regarding interference to avionics and its rigorous certification process will provide ample, additional independent policing of the designated technical standards.[20]

IV. The Commission Need Not Consider the Aircraft Safety or Social Aspects of Airborne Handset Use, as the FAA and the Airlines Have Jurisdiction Over These Matters

As the NPRM recognizes, the FAA is responsible for the regulation of the use of electronic devices on board aircraft to protect against interference of these devices to aircraft avionics. While

---

[17] *See* 47 C.F.R. § 15.525 (registration required for UWB imaging devices for coordination purposes); § 15.240(f) (registration required for RFID devices in the 433 MHz band).

[18] The obligation could apply directly to the grantees of pico cell equipment authorizations, who would be required to ensure that their customers register each pico cell installation with the Commission.

[19] *See Review of Part 15 and other Parts of the Commission's Rules*, Third Report and Order, 19 FCC Rcd 7484 (rel. Apr. 23, 2004) at ¶ 20 ("Consistent with NTIA's letter stating the need to protect critical government radar operations from interference, we are requiring grantees to register the locations of users of 433 MHz RFID systems with the Commission. Registration of 433 MHz RFID systems is not a coordination, pre-approval, or licensing process . . . . Rather, registration will allow the Commission and NTIA to monitor the deployment of 433 MHz RFID systems and help pinpoint the source of interference to government operations in case such interference occurs.").

[20] For example, AirCell expects that the FAA will include the FCC's technical standard within its DO 160 certification requirements, which will ensure absolute compliance.

the Commission should welcome the input of the FAA in this proceeding, it need not delay its decision pending action from the FAA. If the FAA ultimately adopts a more stringent technical standard for the use of wireless phones in aircraft than the Commission adopts, the FAA standard will obviously govern, which will ensure the continued protection of aviation safety. Therefore, this proceeding should remain focused on how wireless communications can be introduced to the aircraft cabin in a manner that protects terrestrial services from harmful interference, while issues of aircraft safety and airborne wireless device use are left to the expertise of the FAA and the airlines.

As the Commission has already seen, thousands of comments have been filed in this proceeding, primarily as part of an organized letter-writing campaign. Most of these identical letters raise concerns about passenger behavior and the discomfort of sitting near a person who talks on the phone during a flight. An additional concern has been expressed that passenger tempers may flare if "obnoxious" wireless phone users disrupt other passengers. AirCell believes that airlines can, and will, set policies on appropriate cellular handset use on their aircraft to protect the interest of all their passengers and crew.

These objections are similar to the resistance raised with the first wave of wireless phone growth. As it turns out, the American people have determined how to use their phones in a generally acceptable manner. As more and more people become wireless subscribers and realize the advantages for themselves, they became much more tolerant of other wireless users and more considerate in their own use.

As a matter of fact, during most of the last 20 years, telephones have been available at every seat on most commercial aircraft, and although usage never approached terrestrial wireless phone levels, millions of calls have been made on commercial airlines without any evidence that fights or rancor ever resulted.

Finally, although some commenters have suggested that allowing cell phone use on aircraft could jeopardize aviation security (by allowing terrorists to use cell phones to coordinate missile strikes on aircraft), just the opposite is true. First, a majority of commercial airlines have a readily available way for terrorists to communicate anywhere in the world –-Airfone's seatback telephones. Second, there is no practical way to keep cell phones from being used by someone determined to do so. Cell phones can be used in an aircraft lavatory and a cell phone's text message feature can be used without detection. On the other hand, a pico cell/RF management system that will allow the controlled use of cell phones on aircraft will greatly enhance aviation safety. In the event of a system-wide alert from the Department of Homeland Security or the Federal Air Marshals, the pico cell/RF management device can be engaged in a way that will prevent all cell phones from functioning inside the aircraft (particularly at lower altitudes when aircraft are most vulnerable), a protective feature that is certainly not available today.

In sum, the airlines will be able to set rules for the use of wireless handsets on their aircraft, as they have for wireless phones used while parked at the gate. These rules of use will be monitored by the FAA from a safety perspective, and AirCell is confident that passengers will find the necessary equilibrium to allow wireless handset use while respecting their neighbors' space.

Respectfully Submitted,

AIRCELL, INC.

/s/ William J. Gordon
William J. Gordon
Vice President for Regulatory Affairs
1725 I Street, NW
Suite 300
Washington, D.C. 20006

/s/ Michele C. Farquhar
Michele C. Farquhar
David Martin
HOGAN & HARTSON L.L.P.
555 Thirteenth Street, N. W.
Washington, D.C. 20554
(202) 637-5600

Its Attorneys

Dated: May 26, 2005